

WHAT IS CLAIMED IS:

1. A melt-pourable explosive composition comprising:

30 weight percent to 70 weight percent of one or more organic binders selected from the group consisting of mononitro aromatics and dinitro aromatics, said one or more organic binders collectively exhibiting a total energy of detonation lower than trinitrotoluene and collectively having a total melting point in a range of 80°C to 115°C;

5 weight percent to 35 weight percent of one or more oxidizers; and

5 weight percent to 35 weight percent of one or more reactive metallic fuels,

wherein said melt-pourable explosive composition becomes pourable at a temperature in a range of 80°C to 115°C.

2. The melt-pourable explosive composition of claim 1, wherein said one or more organic binders comprise at least one mononitro aromatic compound and at least one dinitro aromatic compound.

3. The melt-pourable explosive composition of claim 1, wherein said mononitro aromatics each comprise one nitrocarbon moiety and wherein said dinitro aromatics each comprise two nitrocarbon moieties.

4. The melt-pourable explosive composition of claim 1, wherein said one or more organic binders comprise at least one member selected from the group consisting of mononitro-substituted and dinitro-substituted phenyl alkyl ethers.

5. The melt-pourable explosive composition of claim 1, wherein said one or more binders comprise at least one member selected from the group consisting of 2,4-dinitroanisole, 2,4-dinitrophenotole, and 4-methoxy-2-nitrophenol.

6. The melt-pourable explosive composition of claim 1, wherein said one or more binders comprise 2,4-dinitroanisole.

7. The melt-pourable explosive composition of claim 1, wherein said one or more binders comprise an N-alkyl-nitroaniline processing aid.

8. The melt-pourable explosive composition of claim 1, wherein said one or more binders comprise N-methyl-nitroaniline as a processing aid.

9. The melt-pourable explosive composition of claim 1, wherein said one or more binders comprise at least one processing aid selected from the group consisting of N-alkyl nitroaniline and N-aryl-nitroaniline, said processing aid accounting for not more than 1 weight percent of the melt pourable explosive composition.

10. The melt-pourable explosive composition of claim 1, wherein said one or more reactive metallic fuels comprise aluminum.

11. The melt-pourable explosive composition of claim 1, wherein said melt-pourable explosive composition undergoes an onset of thermal decomposition at a temperature that is at least 55.5°C higher than said temperature at which said melt-pourable explosive composition becomes pourable.

12. The melt-pourable explosive composition of claim 1, wherein said melt-pourable explosive composition exhibits a card gap of less than 105.

13. The melt-pourable explosive composition of claim 1, wherein said melt-pourable explosive composition exhibits a card gap of less than 85.

14. The melt-pourable explosive composition of claim 1, wherein said melt-pourable explosive composition has a total energy of detonation of 11.6 kJ/cc to 14.2 kg/cc.

15. A melt-pourable explosive composition comprising:  
30 weight percent to 70 weight percent of one or more organic binders selected from the group consisting of mononitro aromatics and dinitro aromatics, said one or more organic binders collectively exhibiting a total energy detonation lower than trinitrotoluene and collectively having a total melting point in a range of 80°C to 115°C;

5 weight percent to 35 weight percent of one or more inorganic oxidizers; and

5 weight percent to 35 weight percent of one or more reactive metallic fuels,

wherein said melt-pourable explosive composition becomes pourable at a temperature in a range of 80°C to 115°C.

16. The melt-pourable explosive composition of claim 15, wherein said one or more organic binders comprise at least one mononitro aromatic compound and at least one dinitro aromatic compound.

17. The melt-pourable explosive composition of claim 15, wherein said mononitro aromatics each comprise one nitrocarbon moiety and wherein said dinitro aromatics each comprise two nitrocarbon moieties.

18. The melt pourable explosive composition of claim 15, wherein said one or more organic binders comprise at least one member selected from the group consisting of nitrotoluenes, dinitrotoluenes, and dinitronaphthalenes.

19. The melt-pourable explosive composition of claim 15, wherein said one or more organic compounds comprise at least one member selected from the group consisting of nitrophenols, dinitrophenols, mononitroanilines, and dinitroanilines.

20. The melt-pourable explosive composition of claim 15, wherein said one or more organic binders comprise at least one member selected from the group consisting of mononitro-substituted and dinitro-substituted phenyl alkyl ethers.

21. The melt-pourable explosive composition of claim 15, wherein said one or more binders comprise at least one member selected from the group consisting of 2,4-dinitroanisole, 2,4-dinitrophenotole, and 4-methoxy-2-nitrophenol.

22. The melt-pourable explosive composition of claim 15, wherein said one or more binders comprise 2,4-dinitroanisole.

23. The melt-pourable explosive composition of claim 15, wherein said one or more organic binders comprise at least one heterocyclic compound.

24. The melt-pourable explosive composition of claim 15, wherein said one or more binders comprise an N-alkyl-nitroaniline processing aid.

25. The melt-pourable explosive composition of claim 15, wherein said one or more binders comprise N-methyl-nitroaniline as a processing aid.

26. The melt-pourable explosive composition of claim 15, wherein said one or more binders comprise an N-aryl-nitroaniline processing aid.

27. The melt-pourable explosive composition of claim 15, wherein said one or more binders comprise at least one processing aid selected from the group consisting of N-alkyl nitroaniline and N-aryl-nitroaniline, said processing aid accounting for not more than 1 weight percent of the melt pourable explosive composition.

28. The melt-pourable explosive composition of claim 15, wherein said one or more inorganic oxidizers comprise at least one member selected from the group consisting of perchlorates and nitrates.

29. The melt-pourable explosive composition of claim 15, wherein said one or more inorganic oxidizers comprise at least one perchlorate selected from the group consisting of ammonium perchlorate, sodium perchlorate, and potassium perchlorate.

30. The melt-pourable explosive composition of claim 15, wherein said one or more inorganic oxidizers comprise at least one nitrate selected from the group consisting of ammonium nitrate, sodium nitrate, strontium nitrate, and potassium nitrate.

31. The melt-pourable explosive composition of claim 15, wherein said one or more inorganic oxidizers have an average particle size of 3 microns to 60 microns.

32. The melt-pourable explosive composition of claim 15, wherein said one or more inorganic oxidizers have an average particle size of 5 microns to 20 microns.

33. The melt-pourable explosive composition of claim 15, wherein at least 95 weight percent of said melt-pourable explosive composition comprises a combination of said one or more organic binders, said one or more inorganic oxidizers, and said one or more reactive metallic fuels.

34. The melt-pourable explosive composition of claim 15, wherein at least 99 weight percent of said melt-pourable explosive composition comprises a combination of said one or more organic binders, said one or more inorganic oxidizers, and said one or more reactive metallic fuels.

35. The melt-pourable explosive composition of claim 15, wherein said one or more reactive metallic fuels comprise aluminum.

36. The melt-pourable explosive composition of claim 15, wherein said melt-pourable explosive composition undergoes an onset of thermal decomposition at a temperature that is at least 55.5°C higher than said temperature at which said melt-pourable explosive composition becomes pourable.

37. The melt-pourable explosive composition of claim 15, wherein said melt-pourable explosive composition exhibits a card gap of less than 105.

38. The melt-pourable explosive composition of claim 15, wherein said melt-pourable explosive composition exhibits a card gap of less than 85.

39. The melt-pourable explosive composition of claim 15, wherein said melt-pourable explosive composition exhibits a dent depth in a range of 0.713 cm to 0.872 cm.

40. The melt-pourable explosive composition of claim 15, wherein said melt-pourable explosive composition has a total energy of detonation of 11.6 kJ/cc to 14.2 kg/cc.

41. A melt-pourable explosive composition comprising at least one binder, at least one oxidizer, and at least one reactive metallic fuel, wherein the melt-pourable explosive composition becomes melt-pourable at 80°C to 115°C, undergoes an onset of thermal decomposition at a temperature that is at least 55.5°C higher than said temperature at which said melt-pourable explosive composition becomes pourable and exhibits a card gap of less than 105, a dent depth in a range of 0.713 cm to 0.872 cm, and a total energy of detonation of 11.6 kJ/cc to 14.2 kg/cc.

42. The melt-pourable explosive composition of claim 41, wherein the card gap exhibited by the melt-pourable explosive composition is less than 85.

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